An Extension of Theory of Planned Behavior: Role of M- Commerce Adoption in Rajasthan

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ABSTRACT--With higher advancement in the area of technology and internet, mobile internet device has created an opportunities for electronic-businesses to take the advantage of mobility. Therefore, currently, mobile commerce (m-commerce) has proved to have huge impact on business growth and its' survival. M-commerce, is a method of buying products and services anywhere, using a wireless device having internet accessibility. In current era, mobile phone is not just a device to make calls and text messages, but also used to perform financial transactions and providing many more value added services. Therefore, the current study focuses on extending and examining the Theory of Planned Behavior (TPB) developed by Ajzen, 1991, with a view to study the user's' m-commerce service adoption in Rajasthan state. The study was conducted using a structured questionnaire from m-commerce services users in Rajasthan. All three determinants of purchase intention were studied i.e. Subjective Norms, Attitude, and Perceived Behavioral Control (PBC). Regression analysis was used to predict the effect of determinants TPB on users' adoption of m-commerce. The findings reveled a significant and positive effect of subjective norms, attitude, and perceived behavioral control (PBC) on users' intention towards adopting m-commerce services.

Keywords-- Theory of Planned Behavior, M-commerce, Intention, Internet and Technology.

I.   INTRODUCTION

In past two decades, e- commerce has brought incredible shift in the field of business and communication across the globe. As a result to the advancement in wireless technology and mobile communication, Mobile commerce has started to put a huge impact on business growth and success. In current scenario, as a result of tremendously high internet and mobile device users, telecom industry has witnessed massive growth prospects in m-commerce and has been investing considerably in its expansion (Xie, 2009). India has become second largest country with over 560 million internet users behind China (Statistica, 2020). Further, smart phones' sales in India is expected to grow up to 14 percent in 2020 according to analyst firm TechArc. Mobile commerce sale is further estimated to be around 38 billion US dollars by 2020 according to Statistica report 2020. Due to value added services, advanced communication technology, varieties of features, increased penetration of mobile phones, m-commerce market is expected to have vast potential for its adoption across the country.

According to Chaffey (2009), Mobile commerce or m-commerce is electronic transactions and communications performed using a wireless connection or a mobile phone. Tsalgatidou & Pitoura (2001) mentioned that m-commerce functions differently than e-commerce, because of some network, situations, and environmental constraints. M-commerce facilitates not only B2C model, but also B2B commerce to ensure greater

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efficiency. Shankar et al. (2010) mentioned that m-commerce provides a platform to the sellers to influence customers' environments instead of customers approaching to the company's sales environment with no restrictions of location and time using mobile device. Therefore, mobile-commerce is used in the many areas like retail, banking, healthcare, government etc.

M-commerce is mainly seen as an information system by its users. Qingfei et al. (2008) stated that users' approval is considered to be a key essential for growth of M-commerce. Using this, sellers could easily decrease time by retrieving data and can develop new business opportunities in real situations. Numerous researches were done to study determinants of m-commerce (Martin, 2012: Langendoerfer, 2002; Jaradat & Rababaa; 2013). According to Wu and Wang (2005), m-commerce users get partial and insufficient information because of mobile terminal restrictions. Further, Langendoerfer (2002) concluded that psychological factors like privacy, instead of technical errors, are the major cause to resist m-commerce usage. Martin (2012) concluded a company's ability to perform m-commerce operations primarily depends on the degree by which it ensures technological competency, customer's value, and mobile business. Numerous factors have turned out to be significant for the progress of m-commerce i.e. ease of usage, security, usefulness, privacy, trust etc. Further, a customer's choice to use m-commerce too is affected by subjective norms. Several theoretical models have been developed to extract the determinants of adopting IT at individual and at society level. The theory of reasoned action (Ajzen and Fishbein, 1977), technology acceptance model (Davis et al., 1989), theory of planned behavior (Ajzen and Madden, 1986), are popular theoretical models. The current study focuses on exploring customer's acceptance behavior towards m-commerce using the most commonly and widely used theory to study users' intention or behavior i.e. Theory of Planned Behavior established by Ajzen (1991).

II.   LITERATURE REVIEW

Many researchers have varieties of opinions about electronic-commerce and mobile commerce. According to), m-commerce is considered as a subset of e-commerce in which retailers carry out their businesses using mobile device (Abdelkarim and Nasereddin, 2010). Further, m-commerce was considered as an extension of e-commerce (Vrechopoulos et al., 2003), which is purely based on IT, which offers products and services using mobile networks. Characteristics of customers is considered to be a significant predictor to determine behavioral outcomes (Bagozzi and Yi, 1988), (Karahanna et al., 1999), (Davis et al., 1989).

Vrechopoulos et al. in 2002, studied the customer behavior and m-commerce adoption in Greece, Germany, and Finland, and observed the significant differences among the customers. The study discovered that European customers' were found to have higher rate of m-commerce adoption, because of higher mobile quality devices, better services, less prices, more security, and higher speed. Additionally, Kini and Bandyopadhyay (2006) discussed that better pricing, higher quality, and availability of mobile devices are the key factors to opt mobile commerce. Further, performance expectations, societal influence, favourable conditions are the major factors to influence m-commerce adoption in Chine (While Park et al., 2007). However, Kini (2009) studied that inspite of high speed internet access, high service quality, and better prices, people are not satisfied using m-commerce. According to Thakur & Srivastava (2013), intention to adopt m-commerce is established on the constructs of technology acceptance model and innovation resistance theory. The study output depicted that social influence,

perceived usefulness, perceived ease of use has a significant contribution towards adopting m-commerce for conducting their businesses. Further, results revealed that risks related to privacy and security were negatively related to m-commerce adoption. Alkhunaizan and Love (2013) discussed the effect of demographics (education, age, gender etc.) on m-commerce usages in Saudi Arabia. The findings indicated no significant effect of gender and education level on m-commerce usages, but age did have significant impact on the same. On the contrary, Park et al. (2007) examined the significant effect of education level and gender, but no major impact of internet usages on m-commerce adoption.

With a view to explore consumers' behavior towards adopting m-commerce in Rajasthan, the study used theory of planned behavior (TPB). TPB is a prolonged form of TPB, which is used to understand and predict a user's behavior. As per TPB, intention's determinants to perform a task are subjective norms, attitude, and PBC.
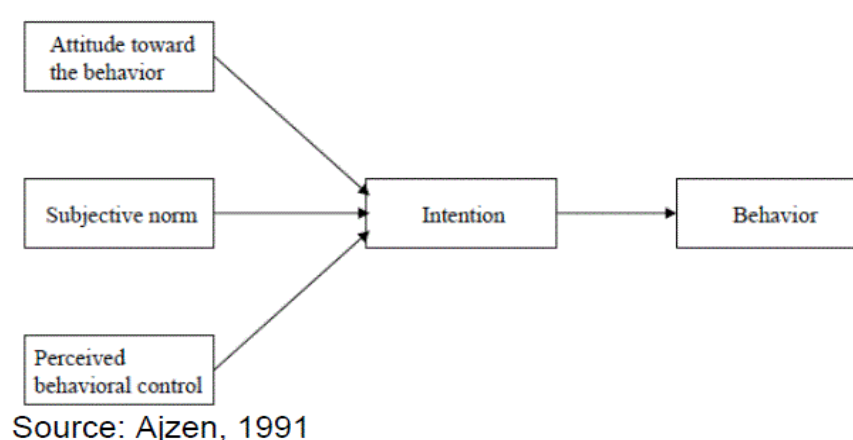
Figure 1: Theory of planned behavior

A person's attitude can be determined using his belief about a specific behavior which will lead to a specific result and his assessment of the output. According to Zeithaml (1988), Purchase intention is customers' willingness to purchase a product. Consumers' positive attitude about a product or brand results into their positive purchase intentions. Many past studies have established the attitude's significant effect on purchase intention (May, 2005; Korzaan, 2003; Kelly et al., 2006; Taylor and Todd, 1995). Based on the literature the following hypothesis has been formed:

(H1): Attitude toward m-commerce significantly and positively affect customers' intention towards m-commerce adoption.

Further, Subjective norms can be understood as perception of an individual about what others around him think or believe he should do. Subjective norm is a person's perception about agreement or disagreement of his/her behavior by people around (Ajzen, 1991; Fieshbein and Ajzen, 1975). The people who influences one's behavior are friends, family, colleagues etc. In a country like India, social norms play a critical role in one's decision and people value more to the emotions of the society instead of the benefits associated with any specific behavior (Sinha et al., 2001). An individual would always make an effort to satisfy the group norms he is associated with.

If the perception of the group members allows m-commerce adoption, one would also approve the same. Based on the literature support, the following hypothesis could be formed:

(H2): Subjective norms toward m-commerce significantly and positively affect customers' customers' intention towards m-commerce adoption.

Lastly, (PBC) is one's perception about how easy is to carry out a particular behavior. Resource availability, results in higher perceived control over a particular behavior (Ajzen, 1991). Previous studies have established a positive and significant relation between Perceived behavioral control (PBC) and purchase intention (Taylor and Todd, 1995; Downs & Hausenblas, 2005). Therefore, with the available resources, more an is perceived to capable of performing a task, more positive will be the intention to perform m-commerce transaction. On this literature, the hypothesis below can be formed:

(H3): Perceived Behavioral Control (PBC) toward m-commerce significantly and positively affect customers' customers' intention towards m-commerce adoption.

As per Fishbein and Ajzen, (1975), Behavioral intention is people's perception about performing a specific behavior. TPB suggests that positive attitude, subjective norms, and larger perceived behavioral control (PBC) results into an individual's positive intention towards a specific behavior (Ajzen, 2002). Customer's behavior can very well be predicted by their purchase intention to behave particularly (Morwitz & Schmittlein, 1992). A person's strong intention leads to them to perform a specific behavior.

III. RESEARCH METHODOLOGY

Sample Design and data Collection

To serve the aim of the study and to study behavior intention of m-commerce users, a structured set of questions were used using a questionnaire, for data collection from the different m-commerce users across the different cities of Rajasthan state. Total 300 questionnaires were distributed, out of which total 230 responses were found to be useful with the response rate of 69 percent. At the beginning of the survey questionnaire, a brief description was given about m-commerce. The questionnaire included demographics of the respondents at the initial section, followed by the different statements about attitude, perceived behavioral control, subjective norms, purchase intention, and behavior towards an act. The statements of the questionnaire were developed on the basis of important literature shown in the table below. A five pointers Likert scale was used to measure these statements ranged from strongly disagree (1) to strongly agree (5).

The sample included m-commerce users of different cities of Rajasthan state. The convenient sample method was used for data collection from the selected respondents under the population. Sample size was selected using thumb rule i.e. 10 observations/cases per indicating variable to fix a lower bound of an acceptable sample size (Nunnally, 1967). The pilot study included 25 users of m-commerce to ensure the items' comprehensibility. The items' reliability was checked by Cronbach alpha, with value of 0.711, which showed the internal consistency among the items.

Table 1: Measurement items and sources

Measurement Items	Source
Attitude ATT1: m-commerce adoption saves me time ATT2: m-commerce adoption is secure ATT3: m-commerce adoption helps me save money ATT4: m-commerce adoption is good for me	Wu and Chen (2005), Lai and Li (2005), and Cheng *et al.* (2006)
Perceived Behavioral Control PBC1: I am capable enough to adopt m-commerce without help PBC2: M-commerce usage is completely under my control PBC3: I have required knowledge, resources, and ability for using m-commerce	Wu and Chen (2005) and Ho and Ko (2008)
Subjective Norms SN1. My relatives, friends believe that I can use m-commerce SN2. According to my friends and relatives, I should be using m-commerce SN3. My friends believe that I must be using m-commerce	Wu and Chen (2005)
Intention INT1: I look forward to adopt m-commerce as soon as possible INT2: I positively intend to use m-commerce in the future INT3: I will be regularly using m-commerce in coming time	Hsu and Chiu (2004) and Ho and Ko (2008)

Sample included 56 % the male participants and rest 44% of the female participants. Whereas, the average age of the respondents were between 20-30 years with more than 50 percent of the total respondents. Further, the average income was recorded to be between Rs. 30000-50000. More than 60 percent of the respondents were recoded to use internet for more than three hours in a day.

IV. DATA ANALYSIS AND INTERPRETATION

To analyse the collected data, correlation analysis and multiple regression analysis was used. Table 2 presented below, represents the correlations among the variables under the study i.e. subjective norms, Perceived behavioral control, Attitude, and Intentions for adopting m-commerce etc. According to the table output, correlation values among the constructs ranges from 0.201 to 0.571; which is less than 0.60, and resulted into no issues related to multicollinearity among the constructs (Hair *et al.*, 1998). Additionally, the table evidently supports the significant relationships between m-commerce adoptions with determinants of theory of planned behavior (TPB).

Table 2: Correlation Output

Construct	Mean	SD	Attitude	SN	PBC	Adoption to m-commerce
Attitude	3.62	0.598	1	0.406	0.201	0.571
Subjective norms	3.49	0.745	0.410	1	0.329	0.461
Perceived behavioral control	3.65	0.572	0.206	0.329	1	0.301
Adoption of m-commerce	3.91	0.762	0.519	0.480	0.310	1

Further, Multiple regression was used to predict the impact of intention's determinants for adopting m-commerce using TPB. The dependent variable was Intention towards adopting m-commerce whereas, PBC, SN, and attitude were used as independent variables. The model summary output is shown below in table 3, showed testing of model fit to test whether TPB fits well to the adoption of m-commerce. The output shows the values of standard error, R, R^2, adjusted R^2, used for determining that whether the said model fits to the data. The output shows the value of regression coefficient (R = .821) and R square = .674. The output depicts the strong positive relation between intention to adopt m-commerce and its predictors. Further, 67.4 % of total variation in m-commerce intention is because of perceived behavioral control, subjective norms, and attitude. The minor difference between R square and Adjusted R square increases the generalizability of the findings.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.821	.674	.656	1.52

Further, overall regression model fit was observed using Analysis of the Variance (ANOVA) in table 4 below. The table output showed that F ratio is 75.26, that is significant ($p < 0.000$) at 5 % level if Significance and shows significant role of the model.

Table4: ANOVAb

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	589.31	3	196.43	75.26	.000a
Residual	591.21	226	2.61		
Total	1360.72	228			

Finally, Table 5 below describes the output of regression coefficient to predict adoption of m-commerce using TPB. The output showed a significant positive relation between intention towards adoption of m-commerce and

its determinants. The regression coefficient for each predictor indicated the degree to which intention towards adopting is dependent over them. The table indicated that if attitude for m-commerce is increased by one unit, the overall intention to opt m-commerce will increase by .489 unit. Similarly, if PBC and subjective norms increase by one unit, the intention will go up by .204 unit, and 0.167 unit respectively. In addition, lager t value with smaller p values indicate higher influence on intention to opt m-commerce. Since, attitude ($t = 7.633$, $p < 0.00$), perceived behavioral control ($t = 3.724$, $p < 0.001$), and subjective norms ($t = 3.614$, $p < 0.000$) significantly contribute for predicting customers' intention towards adopting m-commerce. Thus, we accept the hypothesis (H1, H2, and H3) framed under the study using theiry of planned behavior.

Table 5: Model Summary Table

	Unstandardized Coefficients		Standardized Coefficients	T	Sig	95% Confidence Interval for β	
	β	Std. Error	β			Lower Bound	Upper Bound
(Constant)	1.038	.557		2.513	0.011	-2.671	0.325
Attitude	0.510	0.059	0.489	7.633	0.000	0.425	0.710
Perceived Behavioral Control	0.327	0.079	0.204	3.724	0.001	0.176	0.501
Subjective Norms	0.201	0.051	0.167	3.614	0.000	0.089	0.312

V.   DISCUSSION

The study was focused on studying customers' intention towards adopting m-commerce using planned behavior theory (TPB) to determine the impact of PBC, SN, and attitude on intention towards m-commerce adoption. Out the three determinants of intention towards adopting m-commerce, attitude for m-commerce was found to be the highest significant predictor ($\beta = 0.489$; $p < 0.01$). It means that people use the findings were found to be in line with the previous studies (Chau and Hu, 2002; Heijden, 2003; Davis et al.1989). Similarly, PBC was found to be second most important predictor of intention (($\beta = 0.204$; p= 0.01), which was similar to the past studies (Todd's, 1995; Mathieson, 1991).Lastly, Subjective norms appeared to be the last but significant positive predictor of m-commerce adoption (($\beta = 0.167$; $p < 0.01$), which was found to be similar to the findings reported by (Taylor & Todd, 1995; Chau & Hu, 2002). To summarize, for the purpose of encouraging people for using m-commerce, it becomes essential to showcase the importance and usability of m-commerce to the customers. Additionally, since, users make their choices in the influence to their social circle; thus selective advertisement using social media could be very helpful to target the audience. Further, if people have adequate resources to use m-commerce (mobile devices, high speed data), they could be more inclined towards the using services under m-commerce.

VI. CONCLUSION

Due to the high internet penetration in India, m-commerce adoption is increasing with a rapid rate. The study made an effort to examine an individual's intention towards adopting m-commerce using determinants of TPB i.e. PBC, SN, and attitude towards m-commerce. The study established that attitude for m-commerce is the highest predictor of intention towards adopting m-commerce, followed by perceived behavioral control, and subjective norms. Which indicated that with an aim to increase consumer base, venders of m-commerce have to establish the importance of usage of m-commerce ensuring ease in user interface to gain the faith of customers and meet their expectations. However, other than this, there are few other factors which affect adoption of m-commerce i.e. financial risk, perceived product quality etc. Presently, maximum of the services under m-commerce are limited to the area of financial services only, which needs to be extended in some other areas like retail, health, education also.

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